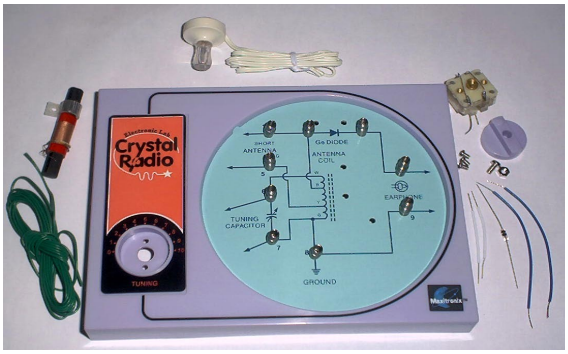
cebekit



CRYSTAL RADIO
MX-901

TOOL YOU MAY NEED

Long-nose pliers
Wire,cutters
Ph llipslype screwdrlver
Pencil or ballpoint pen

PARTS LIST

Antenna Coil
Plastic Case with Labeled Panel
D iode
Earphone
Anten na Coil Cl¡p
Tunrng Capac tor Knob
Nut, (1 ea)
Screw smali, {3 ea.)
Screw, medium (1 ea.)
Spíng Terminals (9 ea.)
Tuning Capacilor
Con necting Wrres:
B ue. Long (2 ea.)
Whlte. Short (2 ea.)
Antenna Wire, Green (3 N,4eters)

INTRODUCTION

With your "Crystal" Fadio Kit you can tune in AfV radro stattons without using batteries or AC powerl This device works on the same principle as the early crystal rad¡o, but the crysta has been replaced with a more reliable modern device called a d¡ode. Your C'ysta, Bad o Kit 'coü.es ro p.evious experience with electronics. You can build and operate it by fo lowing the simple instructions in this manual.

ASSEMBLING YOUR CRYSTAL RADIO

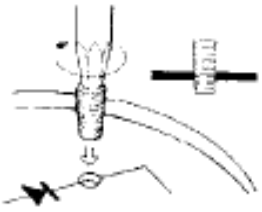
Follow the instructions in the order given, beginning wlth Step 1 .

Notes:

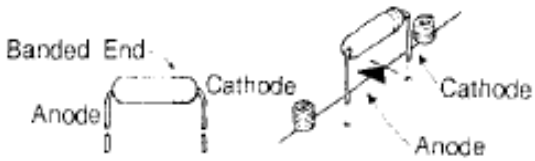
Don't rush. Take your time and enjoy bu¡ld ng your KII,
You can check off each step as you finish it to besure yo{r don't forget an},thing.a
Allthrough these instructions you're asked to make various conr'reclrons. Secure electrical connections are very mponant ln eiectronic devices. One poor connect,on can keep your crystal set from
Be sure all your connections are good ones
To con¡ect a wjre 10 the sprjng terminals:
A - Bend ihe spring to one side with your f nger.
B - Insert the end of the wire into one of the gaps i n : t r e spring.
C - Re ease the sp|ng. l t wi i hold the wire tirrn ly.

Be sure you connect clean. bare wire to each terminal. Some of the wires have insulation that has been stripped of the ends. Other wires have been "t¡nned" (coated with solder) at the ends so that they can make a good connection.
Nake sure lhat you insert the bare end of the wire into the spring terminal Be careful to keep the nsu,ated part out of the spring. If a w¡re has a shiny t¡nned part at the end, Insert the shiny part into the spring.

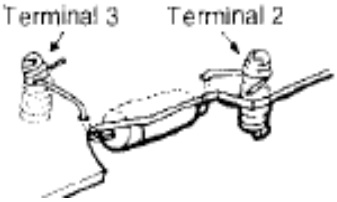
Step - 1 Using your pencrl or pen, punch out the nine larger holes and the tour srnaller holes in the panel.
Step - 2 Copy the term¡nal numbers lrom the frontof the panel to the corresponding positions on the back side
Step - 3 Install the spring terminals :
A - Press the smaller end of each sprlng terminal into one of the punched holes.



B - Use the pointed end of a pencil to tw¡st each term nal firmly into place.
Step - 4 Mount lhe diode as follows:
A - Use your long-nose pliers to bend each of the diode's tvr'o wires as shown.
B - Inserthe wire from the diode's stnped (cathode)end thro!gh lhe hole nearest Terminal 3.
C - Insert tnc ,/rire lrom lhe diode's other (anode) end through the small hole nearesl Terminal 2.

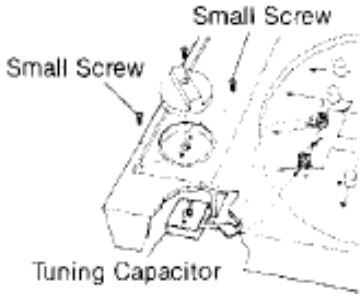


D - Attach the wlre from the diode's strlped end to Terminal 3
E - Attach the wire from the d¡ode's other end to Terminal 2.



Note: A diode allows currento pass through it in only one direciron, from anode to cathode. fhis ability to block alternating current and pass direct current makes it useful rn many types of electron¡c c¡rcu¡ts.

Slep – 5 Mount th tuning capacrlor :

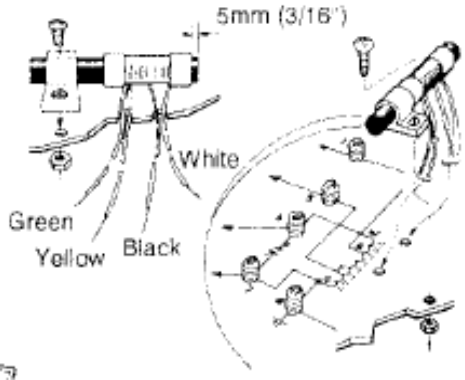


A - Position the capacrtor beneath the panel opening that is just above the word TUNING.
B - The metal shaft ol the capacitor should extend through the openrng.
C - Faslen the capacitor to the panel using the two srna screws.

Step - 6 Install the luning capacitor's knob :
A - Turn the tuning capacitor's shaft all the way to the left.
B - Piace the tunjng knob on the upper end of the shaft
C - Llne up the dot on the knob wlth the 0 on lhe paner.
D - Faster :he knob in place using the reinaining smalll screw.

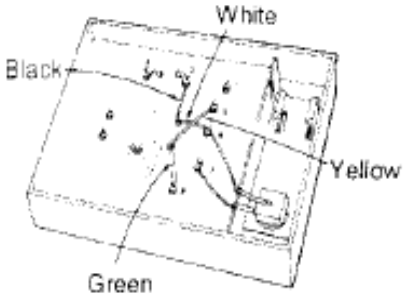
Step - 7 Connect the tuning capacitor's wires:
A - Connect the wire from the tuning capacitor's langet silver strip to Terminal 6.
B - Connect the wire from the tuning capacltor's sho,lcr silver strip to Termina 7.

Slep - 8 Install the antenna coil :



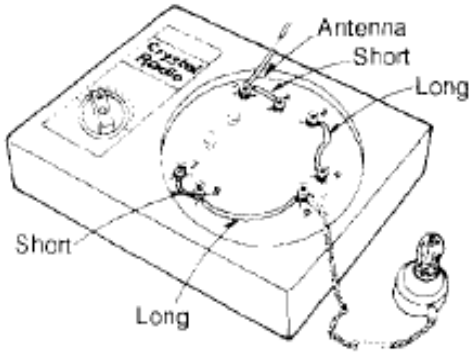
A - Position the antenna coil on the panel near the three rernaining small punched holes.
B - Insert the antenna coil's green and yellow wires through the hole nearest the Y on the diagram.
C - insen the black and white wires through the hole nearest the W on the diagram.
D - Fasten the antenna coil in place wiih lhe nylon clip, medium screw, and nut, using the last of the small punched holes.

Step -9 Connect the antenna coil wires:



A - Connecr the black wire to Terminal 2.
B - Connect the yel¡ow wjre to Terminal 5
C - Connect the while wire to Terminal 6.
D - Connect the green wire to Terminal 8.

Step - 10 Instafl the blue and white connecting wires:



These connecting wrres can be instailed either on the front or the back of the panel. We suggest that you pul thern on the front, so that you can see how the wiring relates to the diagram on the panel.
A - Connect a short wire between Termrnals I and 2
B - Connect a lo¡g wlre between Terminals 3 and 4.
C - Connect a short wire belween Terminals 7 and 8 .

Step - 11 Use your wire cutters to neatly trim the ends of all the w¡res.
Step - 12 Connect the earphone wires to Termrnals 4andL

Step - 13 Install your ground wire:
The ground wire is an lmportant part ot your crystal radjo. Conneci it as caretully as you have connected ail the other parts.
A - From the co¡l of green wire, cut off about 5 feet (150crn)
B - Remove about 6 inches (15cm) of insuiation from one end of the wrre.
C – Find a metal cold water pipe
D - Scrape any paint or d¡rt from the pipe untll you see bright metal al the way around the pipe.
E - Wrap the bare end of the wire several ttmes around the Scraped part of the pipe and twrst the w¡re tightly.
F - Remove % Inch (7mm) of insulatron irom the other end of the ground wire
G -Connect this end of the ground wire to Terminal B of your radio.

Step - 14 Install your antenna:
Your antenna ¡s a very impoftant part of your crystal radio. Connect it as carefully as you have connected all the other parts.
A - Flemove % inch (7mm) of Insulation lrom one end of the remaining length of green wire.
B - Connect this end to Terminal 1 oi your radio.
C - Extend the anlenna w re horizontaily to its full length.

You have oow completed the building of your crystal ladio. lf yoLr have followed the instructions carefully, you should be able to tune n one or more AM,4 radio statrons right away.

USING THE CRYSTAL RADIO

A – Place the earphone in your ear.
B - Adjust the tuning capacitor's knob for the Clearest reception of a local Station.
C - Remember that your crystal radio has no amplifier, so the stations you receive might not be as loudi as if you were listening to a modern radio.

Notes:
- If you ive rn a city, you might be able to receive several stat¡ons.
- ll you do not live near a radlo station, you might need an outside antenna (not supplied), 35 io 85 feet (101o 25m) long, connected to Terminal 5.

lf your radio does not receive stations well, try connecting the antenna w¡re to term nal 6 instead of terrninal 1 or 5. lf reception is still poor, change the antenna coil connection as follows :

White wire from terminal 6 to terminal 2
Black wire frorn terminal 2 to terminal 6

HOW YOUR CRYSTAL RADIO WORKS

All radio broadcast stations do basically the same thing. Thcy combine sound, or audio waves with a radio carries wave. The carrier wave travels great distances. and carries with its information about the strength and pitch of the sound waves

One method of combining the radio carrier wave and the audio wave is called Amplitude Nodulation (AM)

Your AM radio antenna prcks up tne carner wave seni by the radio statlon.

Your crystal radio then does three inlportant thlgs (with sorne help from you) to allow you to hear the radio program. These are:
- Tuning
- Detect¡on
- Changing of an electrical current to sound waves

TUNING

When you turn the tuning capacitor's knob, you are adjusting a circuit formed by the tuning capacitor and the antenna coil. This circult allows only one radio station's carrier wave at a time to enter your radio.
By tuning this circuit, you se{ect the carr er wave lo the station you want to hear'

DETECTION

The d¡ode gets rid oi the carrier wave by sendlng it to the ground through your cold water pipe At the same time. it allows a tiny electric current that represents the sound (audio) inlormation to go to the earphone.

CHANGING ELECTRICITY INTO SOUND

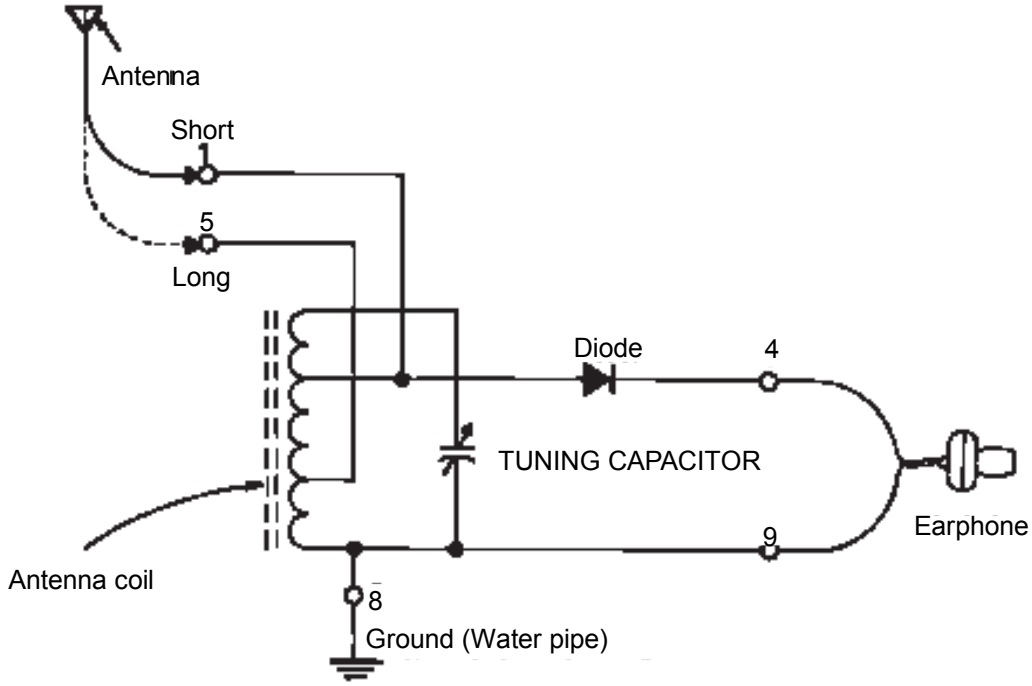
When the electric current reaches the earphone, lt causes a small piece of ceramic material to vibrate. The movement of this ceramic to vibrates the crating the sound waves that you hear.

Your crystal radio works very much the sarme way as the early ones. Of course, the “old-time” crystal sets didn't have diodes. They used a piece of galena crystal (lead ore) held in contact with a fine wire called a “cat's whisker.”

This earlier type of radio, like yours, had no amplification. Then as now, more complicated radios amplified the audio waves to vibrate a loudspeaker and produce ouder sound.

All radios slill use the basjc combination of (1) a tuned circuit that selects the carrier wave sent by tne radio station, (2) a detector that separates the sound inforrnatror from the carrier wave and (3) an earphone or loudspea ker yo let you to hear the sound

SCHEMATIC DIAGRAM



KIT RECOMMENDED FOR CHILDREN From 8 YEARS OLD, ACCOMPANIED BY ADULTS